14120 — 1893

195. ALCOHOL.
Mashing-
Processes.

14120
1893

1893

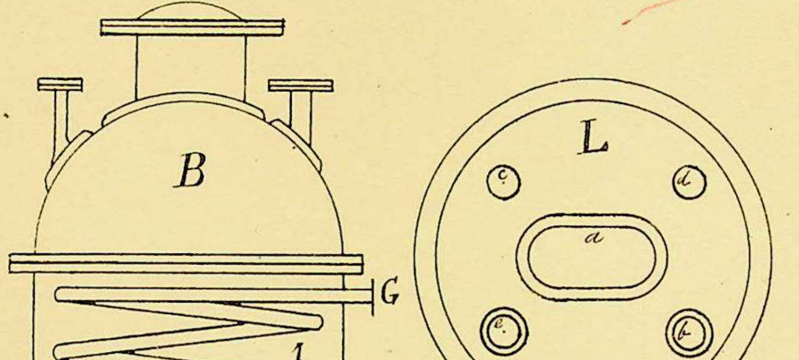
A.D. 1893. July 21. No. 14,120.

JOHNSON—JOHNSON'S Complete Specification.

(1 SHEET)

Mashing
Process

Manufacture of Materials for the Production of Alcoholic and Non Alcoholic Beverages, and in Apparatus therefor



[This Drawing is a reproduction of the Original on a reduced scale]

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Malby & Sons, Photo-Litho.

426/16

EVERAGES

36

DUPLICATE

1893 (1)

RECORDED

31

N° 14,120 A.D. 1893

Date of Application, 21st July, 1893—Accepted, 23rd Sept., 1893

COMPLETE SPECIFICATION.

Improvements in the Manufacture of Materials for the Production of Alcoholic and Non-alcoholic Beverages, and in Apparatus therefor.

I, James Edward Johnson-Johnson Consulting Brewer, F.I.C. F.C.S. Crown Wharf Dace Road Old Ford, Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

My invention relates to the manufacture of and apparatus for making materials in a liquid semi-liquid or solid form from which ale, stout, porter & lager beers or other alcoholic & non-alcoholic beverages may be produced by combining or not combining dextro-maltose & hops together with fermentable & fining adjuncts according to the description of beverage required, also to the purification of such material (without the aid of acids or other chemicals of any kind) from the objectionable bodies which are formed & which cause defects in beer when such beer is produced from worts or solutions made in the ordinary way by mashing malt alone or a mixture of malt & any farinaceous or amylaceous substance to which brewers sugar known as saccharum, invert sugar, glucose *elcetera* may or not have been added. According to my said invention hereinafter to be described these deleterious bodies are removed from the before mentioned worts the resulting beverage being pure & possesses the necessary body, palate, fulness & flavor as well as long keeping qualities.

In an ordinary closed mash tun fitted with regular appliances such as a revolving rake &c. I introduce a sufficient quantity of water (from which solids existing therein in the form of carbonates of the alkalies, or alkiline earths should be, by preference, previously eliminated) together with the raw material to be operated upon. As an example of the quantities of water & raw material to be employed, I take in the case of maize two hundred & eighty-eight (288) gallons of water to each four hundred & eighty (480) lbs. of finely ground & unhusked maize. I now raise & maintain the temperature at boiling point keeping the rake & stirrer in motion until all the starch has been dissolved & transformed, the steam is then shut off & the mixture allowed to cool down to between one hundred & eighty & one hundred & forty degrees Fahrenheit (180 to 140) when finely ground & unhusked malt to the extent of (10) *per cent.* of the raw material employed, mixed with lukewarm water is added to the mash in order to start diastatic action, saccharification takes place & and is allowed to takes its course. The mixture is now filtered by passing it through filter presses or other suitable filtering medium working under pressure and the clear worts thus obtained by filtration are conveyed to a copper apparatus "A" as shewn in the drawings attached hereto, capable of withstanding a steam pressure of one hundred (100) lbs. to the square inch & consisting of a semi-spherical top "B" having thereon (as shewn in plan "L") a man hole "*a*," inlet "*b*" for wort, openings "*c*" for thermometer "*d*" for pressure gauge & "*e*" for safety valve. Two cylinders "C" & "D" each having fixed therein closed copper worms for steam marked "1" & "2" with inlets at "G" & "I" & outlets at "H" & "J," also a semi-spherical end "E" steam jacketted "N" having an outlet "F" together with a perforated copper worm "K" fixed therein for live steam as shewn at "*f*" in plan "M," the whole apparatus being bolted together and joints & fittings secured in the ordinary way. This apparatus is now heated by steam through the closed worms "1" & "2" & steam jacket "N." I then submit the filtered wort previously mentioned & contained therein to a heat, under pressure, of two hundred & fifty (250) to three hundred & twenty (320) degrees Fahrenheit. In this way all the impurities are

[*Price* 8*d*.]

rendered inert. The wort thus treated under pressure I again filter as before described. I then boil this re-filtered wort with a suitable quantity of hops in an ordinary closed copper of usual construction. After boiling with hops for about half an hour I cool this hopped wort by customary means to the proper temperature & place it under fermentation. Or I condense *in vacuo* the wort treated as stated above to a semi-liquid or fourteen (14) lbs. syrup or to forty-five (45) degrees by Beaumé's hydrometer. In the latter case it becomes a solid mass on cooling. Both the last mentioned forms of material being in a highly concentrated state they are eminently suitable for export & for sending long distances for the home trade thus reducing the charges for freight & carriage. I can add to or incorporate with the above specified solid wort fermentable & fining adjuncts. In this case I prepare to use dry yeast & isinglass both in powder mixing them in suitable proportion with the mass during crystallization. To convert this type of material into the required beverage I take it & dissolve it in the necessary quantity of lukewarm water at a temperature not exceeding eighty (80) degrees Fahrenheit & I ferment the resulting liquor in the ordinary manner. From each form or description of wort herein specified I can obtain the desired quality of beer, alcoholic or non alcoholic beverage corresponding to the raw material originally operated upon. In the preparation of wort or extract for the ultimate production of non-alcoholic beverages I confine the saccharification of the mashed raw material to the formation of dextrose essentially by limiting the diastatic power whereby the quantity of saccharose obtained does not exceed five (5) *per cent.* so as to preclude forming more than two (2) *per cent.* of alcohol in the beverage when fermented. I do not confine myself to the employment of the herein mentioned proportions of water to be used with the raw material nor to the quantity of the mixture of malt & water to be subsequently mixed therewith. The quantity of water varies from five (5) to eight (8) times the weight of the material to be treated in the first intsance & the actual quantity to be used as well as the malt & water depending upon the quality & description of beverage intended to be thereafter produced. Neither do I confine myself to any particular size of apparatus nor material used in the manufacture of such apparatus.

Having now particularly described & ascertained the nature of my said invention & in what manner the same is to be performed I declare that what I claim is:

1. The improved method or process of manufacturing worts in a liquid, semi-liquid, or solid state as above specified.
2. The improved worts in a liquid, semi-liquid or solid state manufactured substantially as & for the purpose hereinbefore described.
3. The combination of fermentable & fining adjuncts with the improved wort substantially as set forth.
4. In the production of ale, stout, porter & lager beers & other like alcoholic & non-alcoholic beverages the use of the improved worts substantially as specified.
5. The improved copper apparatus, capable of withstanding a steam pressure of one hundred (100) lbs. to the square inch, as shewn in the drawings substantially as and for the purpose set forth.

Dated this 20th day of July 1893.

JAS. EDWD. JOHNSON-JOHNSON.

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